In the Claims:

1. (original) Assembly composed of a membrane-electrode unit "MEA" (8, 4a, 4b) and a bipolar plate (1) of a fuel cell as component of a fuel cell stack, wherein the MEA comprises a polymer electrolyte membrane (8) and a gas diffusion layer (4a, 4b) resting in the assembly on the membrane with the exception of the membrane periphery, with the bipolar plate (1) resting against the side of the gas diffusion layer opposite the membrane and protruding over the periphery of the gas diffusion layer while forming a circumferential marginal volume zone that is defined at the top, inner and bottom sides by the bipolar plate (1), the gas diffusion layer (4a, 4b) and the membrane (8), characterized in that the circumferential volume zone is filled with a cured adhesive (7) all the way to its defining faces in a gap-free and gas-tight manner.

2. (original) Assembly composed of a bipolar plate and an MEA in accordance with Claim 1, characterized in that the hydrogen side of the bipolar plate (1) is glued together with the anode side of the MEA (8, 4a, 4b).

3. (previously presented) Assembly composed of a bipolar plate and an MEA in accordance with Claim 1, characterized in that the adhesive (7) penetrates into the gas diffusion layer (4a) 0.2 mm to 1 mm.

4. (previously presented) Assembly composed of a bipolar plate and an MEA in accordance with Claim 1, characterized in

that the hardened adhesive (7) is a cured silicone or an epoxy resin.

5. (previously presented) Assembly composed of a bipolar plate and an MEA in accordance with Claims 1, characterized in that the bipolar plate (1) and/or the membrane (8) has been pretreated with a bonding agent in the area of the adhesive.

6. (previously presented) Assembly composed of a bipolar plate and an MEA in accordance with Claim 1, characterized in that a surface of the circumferential volume zone of the bipolar plate (1), which has been bonded with the cured adhesive (7), and a surface of its gas distribution structure (6) are located flush in one plane.

7. (previously presented) Assembly composed of a bipolar plate and an MEA in accordance with Claim 1, characterized in that in an area of gas conducts, also such volume zones which are defined at the top, exterior and bottom sides by the bipolar plate (1), the gas diffusion layer (4a, 4b) and the membrane (8) and which surround the gas conducts (2a, 2b), are filled with a cured adhesive in a gap-free and gas-tight manner.

8. (previously presented) Method for producing a gas-tight assembly comprising providing at least one bipolar plate, providing a gas diffusion layer, providing at least one membrane electrode unit "MEA", providing a circumferential marginal volume zone that is defined at its top, inner and bottom sides by the bipolar plate (1), an edge of the gas diffusion layer (4a, 4b) and the membrane (8) initially applying in a sealing manner a

free-flowing adhesive to a margin of the membrane or the bipolar plate in the form of an adhesive bead that is higher than the gas diffusion layer and whose volume is dimensioned so as to completely fill the circumferential marginal volume zone, and then bringing the adhesive into a shape of the volume zone by assembling the membrane, the gas diffusion layer and the bipolar plate and permitting the adhesive to cure.

9. (previously presented) Method in accordance with Claim 8, characterized in that a hydrogen side of the bipolar plate or of the MEA is glued by applying the adhesive to the hydrogen side of the bipolar plate or of the MEA.

10. (previously presented) Method in accordance with Claim 8, characterized in that the adhesive is allowed to penetrate into the gas diffusion layer by 0.2 mm to 1 mm before curing.

11. (previously presented) Method in accordance with Claim 8, characterized in the gluing process is performed with a curable silicone or an epoxy resin.

12. (previously presented) Method in accordance with Claim 8, characterized in that the bipolar plate and/or the membrane are pretreated with a bonding agent in the area of the adhesive.

13. (previously presented) Method for producing a gas-tight assembly, comprising providing at least one bipolar plate and at least one membrane electrode unit "MEA" with a membrane and a gas diffusion layer, providing a circumferential marginal volume zone that is defined at its top, inner and bottom sides by the membrane, the bipolar plate (1), an edge of the gas diffusion

layer (4a, 4b), initially applying a free-flowing adhesive to a margin of the membrane or the bipolar plate in the form of an adhesive bead that is higher than the gas diffusion layer and whose volume is dimensioned so as to completely fill the circumferential marginal volume zone, and then bringing the adhesive into the shape of the volume zone by assembling the assembly composed of the membrane, the gas diffusion layer and the bipolar plate and permitting the adhesive to cure, further characterized in that a vacuum clamping table is utilized for positioning the MEA with or without gas diffusion layers on the bipolar plate.

14. (previously presented) Method for producing a gas-proof assembly according to Claim 7 which assembly comprises gas conducts, characterized by the fact that at least one of the gas conducts (2a, 2b) conveying the gas, which is not to penetrate into the gas chamber of the assembly, is sealed by a gluing process with the adhesive as described for the marginal volume zone.

15. (previously presented) Application of the assembly composed of a bipolar plate and an MEA in accordance with Claim 1 in fuel cell stacks and/or piles of electrolysis cells where several assemblies composed of a bipolar plate and an MEA are connected electrically in series by stacking.